NEW RESEARCH AND EQUIPMENT FUNDED BY GENEROUS DONATIONS

NRF
NeuroSurgical Research Foundation

SPRING ISSUE / 2014

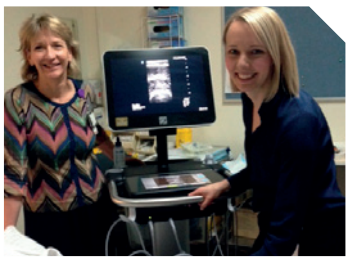
NEW EQUIPMENT BENEFITS HIGH TECH BRAIN SURGERY

A new $500,000 neurosurgical microscope has been donated to the Neurosurgical Department at the Flinders Medical Centre. This microscope will assist in the more precise removal of brain tumours and improve surgical outcomes. This state of the art microscope was donated by David Gunn through the Muriel Gunn Medical Research Trust Fund. The microscope will be used for brain, spinal and blood vessel surgery. FMC Director of neurosurgery, Dr Nick Vrodos said the new microscope will assist surgeons in ensuring patients receive the best possible treatment.

Dr Vrodos said. "It helps improve accuracy when removing a tumour and impacted tissue or nerves by injecting a dye which makes it easier to see the exact limits of tumours. The machine also has the capacity for on-table angiography. This highlights blood vessels during surgery to ensure they are preserved, avoiding strokes, which sometimes are a risk factor with these procedures. Having equipment which allows us to identify and manage potential risks earlier helps us to provide the best possible care and will improve our patients recovery."

Photo: Dr Santosh Poonnoose, Dr Matthew McDonald, Mr David Gunn, Dr Brian North and Dr Nick Vrodos.

PROVISION OF ENERGY AND PROTEIN AFTER TRAUMATIC BRAIN INJURY



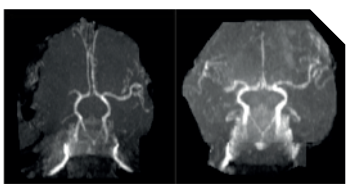
Traumatic Brain Injury (TBI) is a common complex condition with devastating long-term consequences. Recently nutrition has been identified as a key intervention, however providing nutrition to TBI patients is complicated by unique physiological challenges such as high metabolic rate and muscle wasting.

Malnutrition is common 6 months post-injury and likely to influence long-term functional recovery. In Hospital delivery of nutrition to patients with TBI and the factors that influence this have never been formally quantified. Lee-anne Costello, a Dietitian and PhD Candidate, is conducting an observational study at the Royal Adelaide Hospital with Intensive Care consultants Associate Professors Marianne Chapman and Adam Deane that aims to fill this knowledge gap. The aim of this research is to optimize nutritional outcomes which will improve survival and functional outcomes after TBI.

PRE-CLINICAL EVALUATION OF NEW STROKE TREATMENTS

The majority of strokes are caused by a blood clot lodging in an artery blocking blood flow to the brain. The goal of treatment is to restore blood flow to the brain as soon as possible and to minimise the area of brain tissue death to maximise patient function. The new pre-clinical model developed in the Neurological Diseases laboratory seeks to replicate this situation. This model allows for the study of the injury processes that occurs in the brain following blood flow blockage and to better understand the mechanisms by which the brain tissue is injured and dies following stroke. The model will also allow the study of the events that occur in the brain when blood flow is restored and how damage may be minimised. This model will be used to treat stroke in the clinic. This project involves clinician Dr Amal Abou-Hamden, Dr Cristian Grangnaniello and researcher Dr Renée Turner coming together to work towards achieving improved treatment and better outcomes for stroke patients.

These images show magnetic resonance angiograms of the brain. Left: blood flow blocked; Right: blood flow restored.



THANK YOU CITY-BAY NRF TEAM NEURO!

Team Neuro comprised of surgeons, researchers, board members, survivors, friends and family. **Raised $32,000 for neurosurgical research**. They all have a personal story and reason to be fundraising for the NRF. Thank you to all their donors!

TEAM PATRICK

Our team of 20 ran and walked in memory of Patrick Tocaciu who lost his battle with brain cancer in 2013. We hope to help to save lives by helping fund research into cures, improved treatments and increased life expectancy.

Brain tumour survivor Ally also a member of Team Patrick

CATHERINE BRANSON NRF PATRON

Let's do all we can to support the wonderful work of the NRF - improved treatment, perhaps even a cure for Parkinson's disease might one day be an outcome.

NRF TEAM NEURO SPONSORS

Dr Jones & Partners,

Thank you very much Dr Jones and Partners, staff who have joined NRF Team Neuro in the City to Bay. They first hand know how important medical research is to saving lives. David Coorey & family, Phil Wooding Beck Keating, Amy Sancilio & family, Patrick & Margaret Doddridge, Lorne & Rose Klassen, Hannah Grace and Jeff Martin.

THANK YOU TO OUR LOYAL VOLUNTEERS!

Bob, Alan, Renee, Lorne, Markus and David

Serving up Aussie Farmers Direct breakfast and Nippy's orange juice.

ROCKIN-CORSETTES

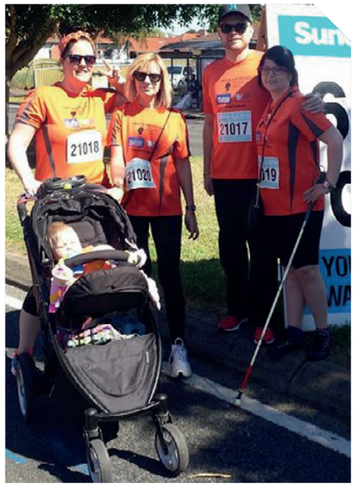
Allison, Melissa and Natalie

Ally's 3 year old daughter had life saving neurosurgery when she was 17 weeks old. Fundraising for neurosurgical research to discover new cures and improve technology.

MARK, LONG TIME NRF SUPPORTER

I have a good friend who is having lots of neurological problems so I am trying to help the NRF. If I can do it anyone can.

BUCKS FOR BRAINS



We are the Sparrow/ Grigoriev family! Greg, Kathy, Dani, Sasha, Mel and Darcy.

In 1996 Mel was born with Aqueduct Stenosis and required her first shunt at 7 weeks old. Living with ongoing medical issues Mel is part of the team pushes herself to succeed at everything she does and to achieved her goals.

NEURO RESEARCHERS

Researchers joining NRF Team Neuro Corinna Van Den Heuvel, Anna Leonard, Stephanie Plummer and Kym Van Den Heuvel. These amazing researchers and their families trying to make a difference in stroke, traumatic brain injury, brain tumour and spinal cord injury research.

Other Team Members

Henrietta: I had neurosurgery two years ago and am now very healthy. I hope that we can raise money for the NRF so that other people who need neurosurgery can be helped.

Anne: Am so grateful for the advances in neurosurgery. Our family remains whole!!!

Sabrina: Wanting to give back to those who gave life to me in 2008 when I suffered a brain aneurysm & underwent emergency surgery at the RAH. I survived & recovered well. In 2012 I was told I had to have surgery again, this time much more invasive & it honestly was one of the most frightening times in my life! I was so blessed to have a wonderful Neurosurgeon.

2015 LIGHTSVIEW RIDE LIKE CRAZY

"The tradition continues"

Since 2010 Lightsview RLC has attracted 9,500 riders and donated a staggering $836,700 to brain cancer research. The NRF has received $400,000 which has been used for research equipment and cancer researchers. In addition to supporting worthy charities, the Lightsview Ride Like Crazy cycling event provides an opportunity in partnership with SAPOL and for sponsors to promote wellbeing and road safety.

Did you know that if you raise $200 you could get your registration refunded by Lightsview Ride Like Crazy?!!! Create an online fundraising page on the Team Flinders site and send a message out to your friends asking them to donate to your cause. All money raised will go directly to the Neurosurgical Research Foundation and the Flinders Medical Centre Foundation.

The first 500 registered participants who raise $200.00 are eligible for a full refund of their registration cost. You must register on www.ridelikecrazy.com before registering on the Team Flinders site.

To enter go to www.ridelikecrazy.com

LIGHTSVIEW RIDE LIKE CRAZY DINNER, FRIDAY 16TH JAN 2015

Join us at the Adelaide Entertainment Centre for an intimate discussion about cycling from nationally and internationally acclaimed speakers. Proceeds will support cancer research.

TO BOOK tickets phone 8204 5216 or online at www.teamflinders.com/ridelikecrazydinner.

LIGHTSVIEW RIDE LIKE CRAZY CYCLE, SUNDAY 18 JAN 2015

Course Information:
Full distance 107.05 km
Short-cut route 90.82 km
Half distance 51.24 km

Entry Fees:
Adult $115 all distances
Child $55 all distances
Woodside transfer: $20

WORLD CLASS RESEARCH AT NRF AGM

The neuroscience research team, led by internationally renowned Professor Robert Vink, continues its leading neuroscience research thanks to the support of the NRF. The team's research priority is to identify solutions for everyday life-threatening conditions including traumatic brain injury, spinal cord injury, brain swelling, repeated concussion, stroke, brain tumours and paediatric conditions. A summary of some of these research projects was presented at the meeting and follows below.

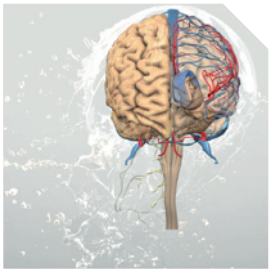
Photo Stefan Court-Kowalski, Stephanie Plummer, Prof Robert Vink, Joshua Burton and Kimberly Mander.

INVESTIGATION OF A PEPTIDE DERIVED FROM THE AMYLOID PRECURSOR PROTEIN(APP), AS A NOVEL THERAPEUTIC AGENT AGAINST TRAUMATIC BRAIN INJURY

It is estimated that between 54 and 60 million people worldwide suffer from a TBI each year. While several candidate therapeutic compounds having been identified in preclinical TBI studies, to date none have translated into successful pharmacological treatments for severe clinical TBI. Our recently published series of studies convincingly demonstrates that a protein found naturally within the brain cells, the amyloid precursor protein (APP), has a protective role against TBI. We, in collaboration with our colleagues at the University of Melbourne who are experts in APP biology, have also identified the specific region in APP that is responsible for this protective activity. Our work has established APP to be a viable and novel therapeutic agent for treating TBI. We now plan to improve the protective activity of APP in order to make it a better therapeutic molecule for the treatment of TBI.

Stephanie Plummer PhD Candidate

INVESTIGATING THE EFFICACY OF PHARMACEUTICAL AGENTS TARGETING BRAIN WATER CHANNELS IN ATTENUATING TRAUMATIC CEREBRAL OEDEMA.



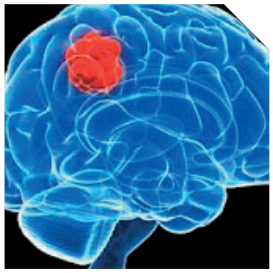
Brain swelling after traumatic head injury is frequently life-threatening. Mechanical damage at the time of trauma increases brain moisture content and associated swelling. Left untreated, such elevations in brain moisture content drives a rise in pressure within the skull, decreasing the availability of oxygen and blood to the brain.

Current treatments, including decompression of the skull or osmotherapies, remain inadequate as they target symptoms rather than causes.

Recently, brain water channels have been identified as being integrally involved in the formation and resolution of brain swelling following acute head injury. The discovery and development of pharmaceutical agents directed at brain water channels offers promise of a non-invasive, mechanistic approach that could revolutionise critical care. We have now shown in an animal brain injury model that sequential application of two agents with distinct effects on water channel activity significantly reduces trauma induced brain swelling, potentially paving the way for a much needed pharmacological intervention in the attenuation of this often lethal injury.

Joshua Luke Burton PhD Medicine

DETERMINING THE MECHANISM OF CANCER CELL ENTRY IN THE DEVELOPMENT OF SECONDARY BRAIN TUMOURS; AN IN VITRO APPROACH TO BLOOD-BRAIN BARRIER RESEARCH.



A secondary brain tumour will arise when cancer cells disseminate from a primary site within the body and spread (metastasise) to the brain. As such, secondary brain tumours are 5-10 times more common in adults than a primary brain tumour and are rapidly fatal. A key event in the development of secondary brain cancer involves the migration of cancer cells from the blood stream into the surrounding brain tissue. Importantly, blood vessels within the brain are the site of a specialised selective barrier, the 'blood-brain barrier', which acts as a critical gatekeeper to regulate the movement of substances between the blood and the brain. Unfortunately metastatic cancer cells are able to breach this barrier. Our team has identified a highly regulated 'trafficking' system within cells of the blood-brain barrier which adequately permits the movement of a number of essential substances into the brain. It is suggested however, in the setting of cancer that this pathway maybe hijacked by opportunistic metastatic cells to serve as an early entry point into the brain. Continued research aims to further explore this relationship as a means of identifying therapeutic targets to obstruct cancer cell entry in secondary brain tumour progression.

Kimberley Mander PhD Candidate

A NEW APPROACH TO BRAIN CANCER TREATMENT THROUGH THE BLOCKADE OF TUMOUR WATER CHANNELS

Stefan Court-Kowalski will be using the world's first drug that specifically blocks water channels in the brain to see whether we can reduce the growth and invasiveness of brain cancer and reduce the associated brain swelling. This has the potential to improve the quality of life of patients suffering from these tumours, as well as enhance the response to surgical treatment, and perhaps prolong patient survival.

- Decrease brain swelling improve quality of life
- Reduce invasiveness enhance surgical response
- Impede tumour growth prolong survival

Stefan Court-Kowalski Fourth year Medical Student undertaking concurrent PhD studies